U.S. Department of Energy's Advanced Natural Gas Reciprocating Engine Program

National Laboratory Support

April 23-24, 2002
Chicago, Illinois
Reciprocating Engines Peer Review

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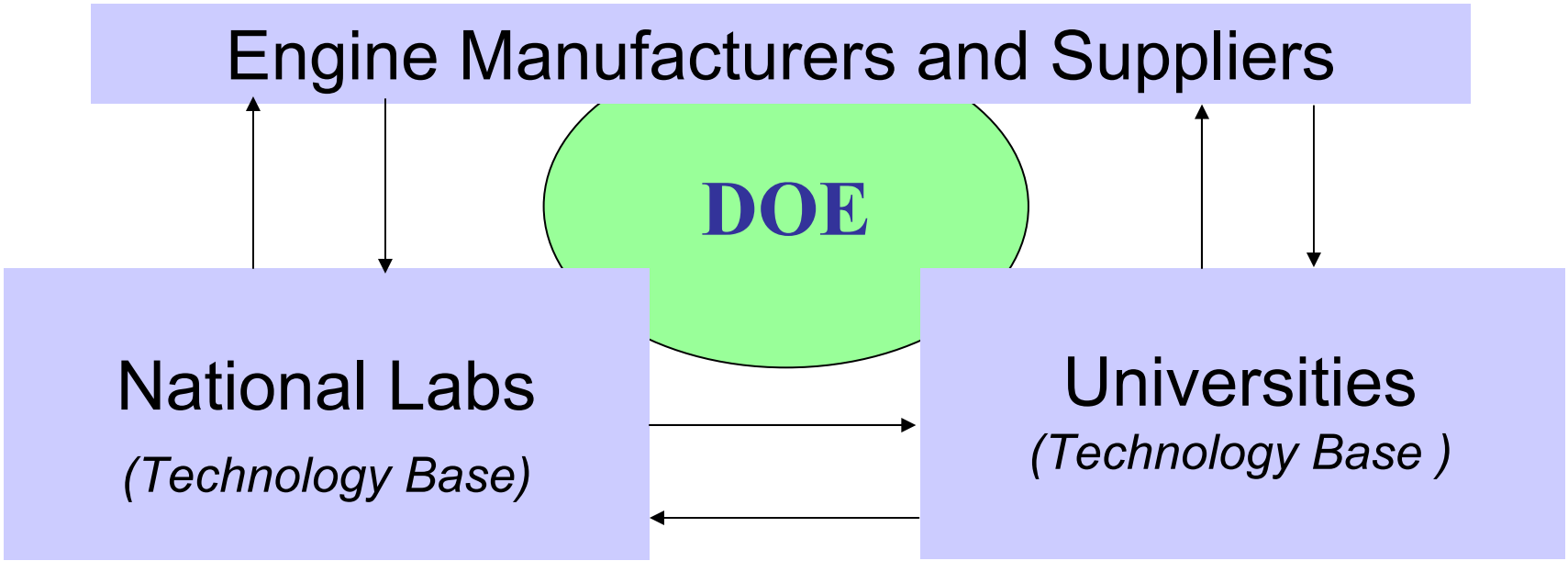
DOE's Strategy is Based on Partnering



- **Leverage limited resources**
- **Reduce financial and technical risks**

National Laboratory Support of ARES

- **Lab Call 00 Completed; Awards Made**
- **Additional Awards After 01 Lab Visits with Engine Manufacturers**

National Laboratory Projects
DOE Lab Call 00

- **Focused on pre-competitive research activities that could have a significant impact in achieving the program goals**
- **Selected projects involving four national laboratories at $3.0 million over 3 years**
  - Sandia National Laboratory
  - Oak Ridge National Laboratory
  - Argonne National Laboratory
  - National Energy Technology Laboratory

Laboratory Visits Completed to Identify Additional Support Potential

- **DOE/industry team visited six major national laboratories (April - June 2001)**
- **Five technology categories covered:**
  - Combustion and ignition
  - After treatment
  - Air handling systems
  - Sensors and controls
  - Friction reduction

Team Identified Extensive Laboratory Capabilities in Advanced Engine Research

- **Industry team evaluated and prioritized 33 technology presentations**
- **Top one-third of list dominated by two technology categories**
  - After treatment
  - Sensors and controls
- **ARES report, including white papers, completed (July 3, 2001)**

Additional Laboratory Support

Work Scope recently implemented

- **Los Alamos – Ceramic Sensors For Emission Control**
- **Oak Ridge- Non-linear Controls for Lean Burn Engine**